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WILMERHALE/BOSTON			EXAMINER	
60 STATE STREET			O'NEILL, KARIE AMBER	
BOSTON, MA 02109				
		ART UNIT	PAPER NUMBER	
		1795		
		NOTIFICATION DATE	DELIVERY MODE	
		05/12/2009	ELECTRONIC	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/628,681

**Applicant(s)**

RILEY ET AL.

**Examiner**

Karie O'Neill

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11, 14, 15 and 17-90 is/are pending in the application.
- 4a) Of the above claim(s) 22-90 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11, 14-15, 17-21 is/are allowed.
- 6) ☒ Claim(s) 1 and 5-10 is/are rejected.
- 7) ☒ Claim(s) 2-4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Request for Continued Examination***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 4, 2009, has been entered.

Claims 1, 11, 14 and 15 have been amended. Claims 12, 13 and 16 have been cancelled. Claims 22-90 have been withdrawn from consideration as being drawn to non-elected claims. Therefore, Claims 1-11, 14-15 and 17-21 are pending in this office action.

### ***Claim Rejections - 35 USC § 102***

2. The rejection of Claims 1, 5-6, 10, 11-12, 16-17 and 21 under 35 U.S.C. 102(e) as being anticipated by Chiang et al. (US 2003/0082446 A1), has been overcome based on the amendments to the claims.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 5-6, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang et al. (US 2003/0082446 A1).

With regard to Claim 1, Chiang et al. discloses in Figures 3A-3D, a bipolar device (10) having an arbitrary form factor, the article comprising: (a) a bipolar structure (10) having an anode (12), a cathode (14) and an electrolyte (16) in contact with and separating the anode and cathode (paragraph 0052), wherein the anode (12) and cathode (14) are interpenetrating (paragraph 0052); (b) a cathode current collector (30) that is in electronic communication with the cathode component (14) (paragraph 0052 and Figure 3); (c) an anode current collector (30) that is in electronic communication with the anode component (12) (paragraph 0052 and Figure 3); Chiang et al. discloses in Figure 3B, a reticulated anode (12) and a reticulated cathode (14), each having protrusions (28) and complementary indentations (26) being in ionic and/or electronic communication with the electrolyte (16) (paragraph 0052). Chiang et al. discloses the bipolar device being a tailorable or customizable device having structures of reticulated interface that can be tailored for purposes of controlling and optimizing charge and discharge kinetics (paragraph 0053). Chiang et al. also discloses in paragraph 0054, that the anode (12) and cathode (14) connectable to a current collector (30), or serving as their own current collector, have a morphology such that the surface exposed is reticulated sufficient to produce features that are periodic and regularly spaced or

aperiodic or random. This means that the bipolar article has the possibility of an overall form that is not cylindrical or prismatic due to the aperiodic or random morphology.

Chiang et al. does not specifically disclose wherein the bipolar article has a thickness that varies over a length scale that is independent of any length scale of the internal electrode structure of the article. It would have been obvious to one of ordinary skill in the art to manufacture the bipolar article a thickness that varies over a length scale that is independent of any length scale of the internal electrode structure of the article, since it such a modification would only involve a mere change in the shape of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. See MPEP 2144.04. Further, it is noted that no degree of change is required by the claim, so absent a teaching that describes a perfect shape, there inherently will be a degree of variation in the shape of the prior art.

With regard to Claim 5, Chiang et al. discloses wherein the anode, electrolyte and cathode are sequentially deposited (paragraphs 0070- 0071, Prophetic Example 1).

With regard to Claims 6 and 10, Chiang et al. discloses a device comprising the bipolar article, wherein the bipolar article is an energy storage system, including, but not limited to lithium ion batteries (paragraph 0044).

5. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang et al (US 2003/0082446 A1), as applied to Claims 1, 5-6, and 10 above, and in further view of Lanni (US 5,949,213).

Chiang et al. discloses the bipolar article in paragraph 4 above, including the bipolar article being a bipolar device, which can be an energy storage device such as a rechargeable battery, but does not disclose wherein the arbitrary configuration of the bipolar article is conformal with at least one surface of the device, wherein the device has a cavity, and wherein the arbitrary configuration of the bipolar article is space-filling within the cavity, and wherein the device is a cellular telephone, laptop computer, personal digital assistant, or the like.

Lanni discloses wherein the battery section, or the bipolar article, is installed in a portable appliance such as a notebook personal computer or mobile telephone (column 4 lines 15-18). Because the battery is installed in the portable appliance means that the battery is conformal to at least one surface of the appliance and fills a cavity within the appliance. Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use the battery, or bipolar article, of Chiang et al. in a device such as a personal computer or mobile telephone, because Lanni teaches the battery, or bipolar article, provides power/current to the portable appliances.

***Allowable Subject Matter***

6. Claims 2-4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
7. The following is a statement of reasons for the indication of allowable subject matter: the closest prior art, Chiang et al. (US 2003/0082446 A1), does not teach or

fairly suggest wherein the cathode current collector is attractive to the cathode network and repulsive to the anode network, and the anode current collector is attractive to the anode network and repulsive to the cathode network, and wherein one or both of the anode and cathode current collectors comprises a coating providing a repulsive force between the current collectors and the opposite anode or cathode network.

8. Claims 11, 14-15 and 17-21 are allowed.
9. The instant claims are to a bipolar article having an arbitrary form factor, the article comprising: (a) a bipolar structure having an anode, a cathode, and an electrolyte in contact with and separating the anode and cathode; (b) a cathode current collector that is in electronic communication with the cathode; and (c) an anode current collector that is in electronic communication with the anode, wherein the anode and cathode are self-assembling networks of particles disposed in the electrolyte, the cathode current collector is attractive to the cathode network and repulsive to the anode network, and the anode current collector is attractive to the anode network and repulsive to the cathode network, and wherein the bipolar article as a whole has an overall form that is not cylindrical or prismatic, the form including a thickness that varies across the length or width of the article.

The most pertinent prior art has been presented. The prior art does not teach the claimed invention.

With regard to Claim 11, the closest prior art, Chiang et al. (US 2003/0082446 A1), does not teach or fairly suggest a bipolar article having an arbitrary form factor,

comprising a an anode, a cathode, an electrolyte in contact with the anode and cathode, a cathode current collector, and an anode current collector, wherein the cathode current collector is attractive to the cathode network and repulsive to the anode network, and the anode current collector is attractive to the anode network and repulsive to the cathode network, wherein the bipolar article as a whole has an overall form that is not cylindrical or prismatic, the form including a thickness that varies across the length or width of the article.

### ***Response to Arguments***

10. Applicant's arguments filed March 4, 2009, have been fully considered but they are not persuasive.

Applicants argue that "bipolar articles having an overall non-cylindrical or non-prismatic form are not described or shown in Chiang et al.". Applicants also submit that the Final Office Action misinterprets the reticulated interface between the electrodes as representing the overall exterior surface of the bipolar article as a whole. As described in the cited paragraphs 53 and 54, and as shown in Figures 3A-D, the electrodes in Chiang are reticulated at their interior interface, where they are "exposed" only to electrolyte (see also, for example, Chiang paragraph 52). The reticulated interface comprises convexities or protrusions and corresponding concavities or indentations "extending into and in ionic communication with electrolyte matrix 16" (Chiang paragraph 52). That is, the reticulated interface relates only to the interior interface



between the electrodes, which does not affect the overall form of the bipolar article as a whole.”

Chaing et al. may not specifically disclose that the overall shape of the bipolar article disclosed is non-cylindrical or non-prismatic, but it also does not teach that the overall shape of the bipolar article disclosed is perfectly cylindrical or prismatic. However, when forming a bipolar article, there is no guarantee that the shape will be perfectly cylindrical or prismatic. Unless stated that the overall shape of the bipolar article disclosed is perfectly cylindrical or prismatic, there is always a degree of non-uniformity and randomness in the way that the materials are placed together or what occurs to the materials during operation of the cell. For instance, Chaing et al. discloses in paragraph 0056, “the thickness of the positive and negative electrodes is approximately uniform and during the charging or discharging the ions must diffuse across the thickness of the electrodes”, and in paragraph 0057, “the present system (10) has a perforated structure, such as electrodes 12 and 14, that has a plurality of channels defined therein and that are filled with electrolyte. The channels can extend through and across the electrode, from the front at interface 34 with separator 16 to the back near current collector 30.” The outer surface of the electrodes have channels that form perforations and further make the outer surfaces of the bipolar article non-cylindrical or non-prismatic due to the perforations. Therefore, the teachings of Chiang do not require the overall shape of the bipolar article disclosed to be perfectly cylindrical or prismatic.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571)272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Ruthkosky/  
Primary Examiner, Art Unit 1795

Karie O'Neill  
Examiner  
Art Unit 1795

KAO